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ABSTRACT

The questions investigated in this study were whether the casual Sunday-afternoon visitor followed a sequence of exhibits at the Peabody Museum of Natural History (Yale University) in the order intended, how much time he spent studying the exhibits, how often he read the labels, and especially, whether this arrangement prevented or even delayed "museum-fatigue." When the individual records were examined, it was found that the route taken by the average visitor was the reverse of that planned in the Guide Book; 24.4 percent of the exhibits were examined; 10.9 percent of the labels were read; and the average time taken by the visitors for reviewing the history of life on the earth during the past 500,000,000 years was 21.40 minutes. Conclusions arising from a behavior inventory of visitors and from a leaflet experiment were: (1) that mere juxtaposition of exhibits in a logical sequence does not, by itself, guarantee their examination by the casual Sunday-afternoon visitor in the order intended, and (2) that the visitors benefited from the use of the leaflets to an extent that was statistically significant. (Author/MF)

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BEHAVIOR OF THE AVERAGE VISITOR IN THE PEABODY MUSEUM OF NATURAL HISTORY YALE UNIVERSITY

By MILDRED C. B. PORTER
Curator of the School Service Department
Peabody Museum of Natural History

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PUBLICATIONS OF
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CONTENTS

ACKNOWLEDGEMENTS	v
I. PROBLEM	1
II. ARRANGEMENT OF EXHIBITS	2
III. BEHAVIOR INVENTORY OF SUNDAY-AFTERNOON VISITORS	8
IV. LEAFLET EXPERIMENT	16
V. CONCLUSIONS	28

Figure 2 deleted due to poor reproducibility, by ERIC at Stanford.

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For the opportunity of pursuing this study in the Peabody Museum of Natural History at Yale University, I am truly grateful to Professor Richard S. Lull, director of the museum at the time the experiment was performed. I also wish to acknowledge a special debt to Professor J. Warren Tilton of the Department of Education at Yale University under whose instruction and friendly guidance my thought on this problem has been molded.

Mr. L. C. Everard, editor of the American Association of Museums, has made many useful suggestions and I am grateful for his aid in seeing the manuscript through the press.

M. C. B. P.

Yale University
New Haven, Connecticut
July 5, 1938

I. PROBLEM

The exhibits on the first floor of the Peabody Museum of Natural History at Yale University are arranged in a definite order to show the geological sequence of animal life from the earliest records in the rocks until the present time, so that as the visitor passes from one hall to another he can review the story of the continuity of life, i.e., Organic Evolution. We wanted to know whether the casual, Sunday-afternoon visitor followed this sequence of exhibits in the order intended, how much time he spent studying them, how often he read the labels, and especially, whether this arrangement prevented or even delayed "museum-fatigue." To answer these questions, an inventory of the behavior of Sunday-afternoon visitors in the Peabody Museum was taken.

II. ARRANGEMENT OF EXHIBITS

Figure 1 shows a scale plan of the first floor of the museum. A large reproduction of this plan is located at the right of the Entrance Hall, toward the rear. To view the exhibits in the order planned, the visitor must pass a Foucault pendulum suspended in the Entrance

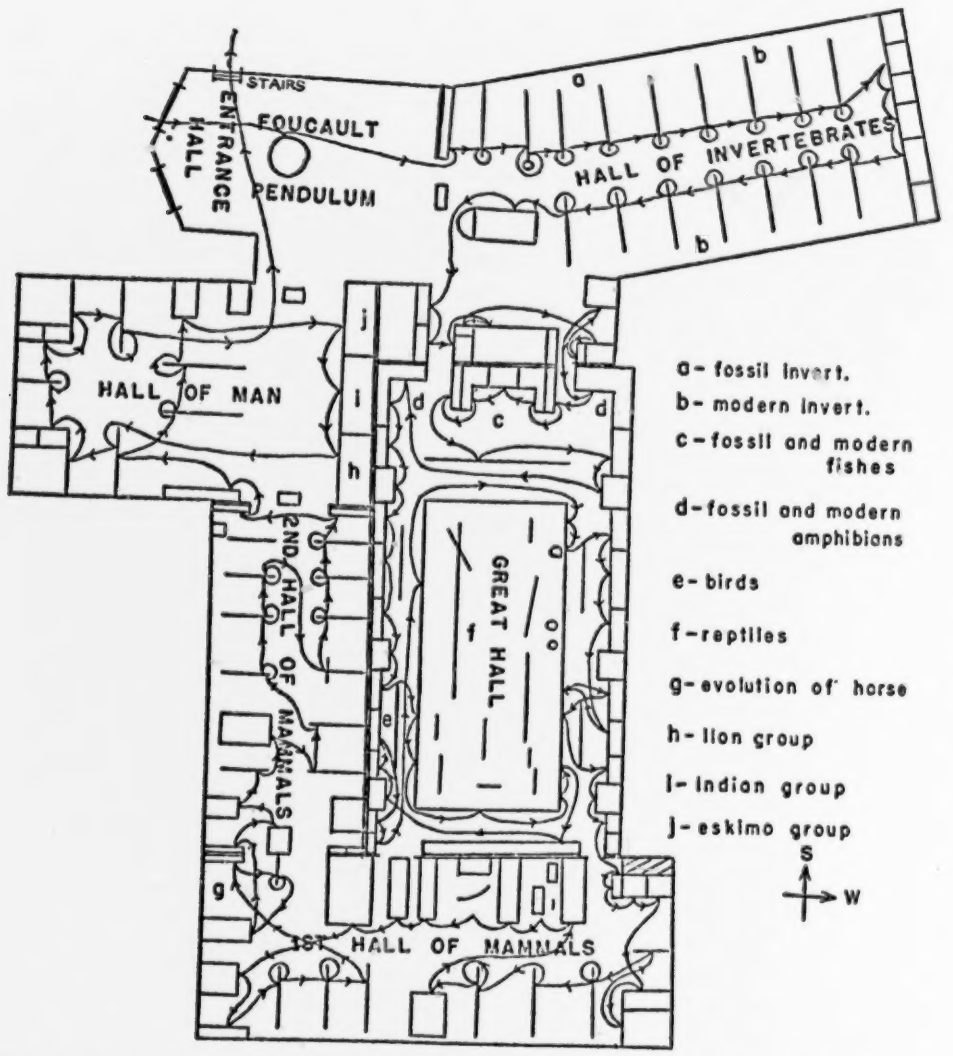

FIG. 1. Scale Plan of the First Floor Showing Route Planned for the Visitor in the General Guide Book

Hall and upon entering the Hall of Invertebrates, he must turn first to the *left*.

HALL OF INVERTEBRATES

The first *left-hand* case contains a large chart called "Geologic History," which explains how the layers of stratified rock that comprise the outer crust of the earth form the pages of a manuscript, the symbols on each page being fossils which indicate the relative age and historical sequence of animal life. Another section of the case explains the meaning of a fossil by showing the manner in which various plants and animals have been preserved. This case, therefore, serves as a table of contents to the exhibit halls.

In this hall, as in each of the succeeding rooms, examples of fossil and living forms supplement each other in unfolding the story of the development of animal life. The first five cases to the *left* of the entrance of the hall show the geologic succession of invertebrate animals.[1] Following this, the biologic series of spineless animals are grouped according to their degree of structural specialization, beginning with one-celled protozoans and ending with the insects.

By way of transition to the vertebrates in the next room, a habitat case in the corner nearest the *left-hand* door, shows some of the earliest Paleozoic vertebrates, the Devonian fishes.

GREAT HALL

Leaving the Hall of Invertebrates by the door on the *left* the visitor enters the Great Hall, containing the fishes, amphibians, reptiles, and birds. At this end of the room, in cases against the wall, are the fishes living today. A table case just before these wall cases contains a synopsis of the fossil fishes of all ages.

Somewhere in the course of evolution, certain animals developed limbs and the four-legged amphibians came into existance. Living members of this group—salamanders, frogs, and toads—are shown in a case against the *left* wall, but for the fossil amphibians it is necessary to cross to the other side of the Great Hall. On the way to these exhibits of fossil amphibians the visitor must *pass two exits*.

The major part of the Great Hall is devoted to the reptiles. The

[1] Vertebrate forms are also illustrated by line drawings and a footprint slab.

aquatic reptiles, ancient and modern, are arranged on the left side of the hall. Some of the dinosaurs are on the right side. In a great central island (see Figure 2) are mounted several skeletons and skulls of dinosaurs, and the largest-known of the marine turtles. To examine all of these exhibits it is necessary for the visitor to make a complete circuit of the hall.

Interrupting the series of dinosaurs, on the farther end of the right wall, are exhibits of birds, both fossil and modern. After having made a complete tour around the Great Hall it is appropriate to view these exhibits of birds, which include four type specimens.[2]

FIRST HALL OF MAMMALS

The vertebrate series is continued in the next room by the mammals. *At the left*, just beyond the entrance to this hall are displayed some of the skeletal remains of mammals that lived during the Age of Reptiles. The most primitive living mammals, such as the egg-laying duckbill and the pouched kangaroo, are in an alcove to the *left* at this end of the hall. The remainder of the room is devoted to the placental mammals. On the *left* of the aisle, small mammals or parts of larger beasts are arranged in cases. On the right-hand side are mounted skeletons of such mammals as the mastodon, elephant, rhinoceros, and the great titanothere. The far end of this hall is devoted almost entirely to the horses. In the counter-case, *between two exits*, is a part of the original series of specimens to show the evolution of the horse. The rest of this early collection with some newer material is exhibited in the *left-hand* corner and shows progressive changes in the feet and skulls of horses.

SECOND HALL OF MAMMALS

In the Second Hall of Mammals are displayed the camels, swine, dogs, and cats, both fossil and recent. In this hall are also the walrus, sea-lion, seal, whale, and porpoise—mammals which forsook the land and went back to the sea. Exhibits in cases are interspersed

[2] These specimens are some of the museum's chief treasures, the skeleton of Icthyornis being unique, and those of Hesperornis very rare. These specimens formed the basis for an entirely new major group of birds—the "toothed birds"—described by Professor Marsh.

with open-mounts on both sides of a central aisle. On the *left-hand* side just before the exit, the series of primate animals begins.

HALL OF MAN

In the Hall of Man[3] the first case to the *left* is occupied by skeletons of man's nearest relatives. Continuing around the hall in a *clockwise* direction the visitor can see models comparing the development of the human embryo with that of other animals. In the center of the room are two cases: one containing restorations of the various races of prehistoric men, and the second a synopsis of the cultural evolution of man, as shown by the work of his hands. The remainder of this part of the hall is occupied by habitat cases. Against the south wall is a Polynesian warrior, and across the west are three groups: An Eskimo in winter quarters, an Indian rock shelter similar to one found near New Haven, and a lion group (temporary installation).

It is now necessary for the visitor to turn back toward the jutting transept of the Hall of Man that is perpendicular to the street in order to see what is displayed as evidence of the methods by which evolution may have taken place.

USE OF GUIDE BOOK

The foregoing description has been condensed from the *General Guide*, which can be purchased for twenty-five cents. In the past ten years about 1000 copies of this book have been sold. The number of guides sold in the first three years was above the average, the fourth and fifth years were about average, and during the last five years the sale has been below average. The 1000 copies include those sold to week-day visitors as well as Sunday visitors, and though there is no record of the proportion, it is reasonable to suppose that many of these guides were sold to week-day visitors rather than Sunday visitors.

The directions given in the guide book conflict in almost every instance with the normal routing tendencies of visitors as demon-

[3] Coincident with the conclusion of this experiment, a complete reorganization of the exhibits in this hall was begun. Various ideas dealing with the development of society such as diffusion, independent invention, and the influence of environment on culture are shown.

strated by Melton's studies. It will be remembered that he found the positions of entrances and exits to be important determinants of the routes of most visitors. Approximately 75 percent of the visitors turn to the right on entering a symmetrical hall and continue around the hall in a counter-clockwise direction. In addition, more than 50 percent of the visitors pass only the objects along the wall toward which they first turn before leaving the gallery. The region passed by the majority of visitors may be limited to one corner of the gallery if the exit is placed to one side of the entrance. The exit of a gallery even competes with the objects on display for the attention of the visitors.[4]

[4] Arthur W. Melton. *Problems of Installation in Museums of Art. Publications of the American Association of Museums. New Series, No. 14, 1935*, pp. 92–150. Also, Arthur W. Melton. "Distribution of Attention in Galleries in a Museum of Science and Industry." *Museum News*, 14: 6–8, June, 1936.

III. BEHAVIOR INVENTORY OF SUNDAY-AFTERNOON VISITORS

The inventory of the behavior of visitors included only those visitors who came on Sunday afternoons. Sunday-afternoon visitors constitute about 75 percent of the museum's total casual visitors; and the relatively small number of visitors in the museum at any other one time made it impracticable to observe their behavior without being detected. Previous experiments have shown that the observation of Sunday-afternoon visitors for experimental purposes is permissible; for although week-day visitors tend to stay in the museum longer than the Sunday visitors, they do not react to the exhibits in a qualitatively different manner.[5]

In this experiment it did not seem practicable to limit observations to those who came into the museum alone. The unaccompanied visitor was so infrequent that it would have taken an unreasonable length of time to obtain an adequate sample of unaccompanied visitors for a statistical analysis of their reactions to the museum exhibits. Besides, as long as unaccompanied visitors are in such a minority, the interest for this problem was concerned with the manner in which the accompanied visitors react to this planned sequence of exhibits. Finally, although it is no doubt true that there is a mutual adjustment of interests which takes place among accompanied visitors, Melton's studies have demonstrated that the accompanied and unaccompanied visitors tend, in general, to be attracted by the same sort of exhibits and to spend approximately the same amount of time in looking at them.[6]

The inventory was conducted for two years during the period from October through May. No observations were made in the summer. As in the case of week-days, the number of visitors in the museum on Sunday afternoons in the summer was not large enough so that they could be observed without the risk of being detected.

[5] Arthur W. Melton. *Problems of Installation in Museums of Art*, pp. 64–69.
[6] Arthur W. Melton. *Problems of Installation in Museums of Art*, pp. 54–64.

Furthermore, university students were trained as observers for this study and their services were available only during the academic year.

The choice of university students as observers was fortunate. Nearly every Sunday afternoon several Yale students came into the museum to study exhibits assigned by various professors of science classes. The student observers, therefore, carried their record cards in a laboratory manual and were able to disguise their activities so completely that during the course of two years of observations very few records had to be discarded because the visitor realized he was being followed.

At the start of such an investigation it is necessary to determine and adhere to a rigid definition of the behavior phases to be observed and to allow the observers a period of training, so that there will be as little variation as is humanly possible in the behavior records made. During the training period both the observers watched the same visitor, without the knowledge of one of the observers, and when this visitor left the museum their results were compared to be certain that they were making similar notations.

Each observer was provided with plans of the first floor. When a group of visitors entered the Hall of Man the first one to step over the threshold was chosen to be observed. As soon as he entered the room a stop watch was started. A separate record was made for each visitor followed, the observer marking on the floor plan the museum cases examined in the order that the visitor looked at them, and every label that he read. When he left the room the stop watch was stopped and the time recorded for that hall. Since the visitor was unaware of his participation in the experiment a grave source of error was avoided, in that no exhibit was examined and no label read because the visitor felt that he ought to do so.

ROUTE TAKEN BY THE VISITOR

In Figure 1 is shown the route that the visitor is expected to take when he views the sequence of exhibits on the first floor as directed by the guide book, which asks him to make all left turns so that many exhibits, important either historically or because of intrinsic significance, are located on the left side of this route.

The route most frequently taken by the Sunday-afternoon visitors is shown in Figure 3. No visitors purchased a guide book on the Sundays these studies were in progress. Such a small number of visitors followed the planned sequence that all of the data presented in this paper are based on those who entered the Hall of Man rather than the Hall of Invertebrates at the beginning of their visit. It is fortunate that the majority of the visitors take this route; for

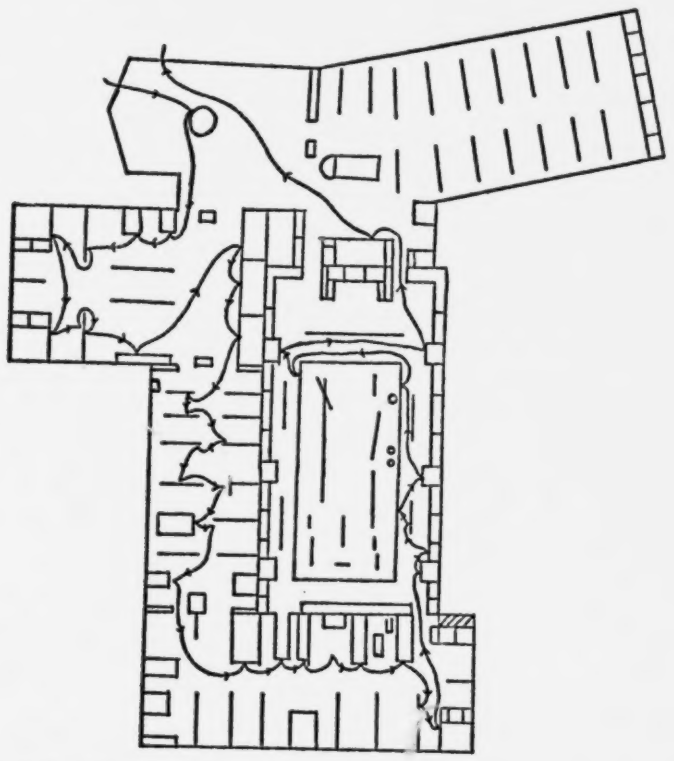

FIG. 3. Plan of the First Floor Showing the Exhibits Most Frequently Examined and the Order in Which They Were Looked at by the Majority of the Sunday-afternoon Visitors

it means that, now, many of the particularly significant exhibits are on the right and stand a better chance of being seen than they would if the visitors had followed the route planned. What difference it makes, educationally, whether the sequence of exhibits is viewed in order from the simplest organisms to the most highly specialized or from the more complex animals downward to the beginnings of life is not known.

TIME SPENT IN THE HALLS

A summary of the time spent in each hall is given in Table I. It can be seen that the longest time spent by any individual was 49 minutes and 55 seconds, and the shortest time was 3 minutes and 11 seconds. The mean length of time spent on the first floor of the Peabody Museum by the group of casual visitors observed was 21.40 minutes, and the Standard Deviation of this distribution was 10.83. Forty-four percent of the visitors stayed longer in the first hall entered than in any succeeding hall.

When the times spent in each hall were analyzed in terms of the number of feet traveled along the most frequent route (see Fig. 3), it was found that the speed of the visitors definitely increased in each hall until they reached the Hall of Invertebrates. In this hall the number of feet traversed was so small in comparison with the other four halls that the time spent per foot was nearly doubled.

The greatest number of feet traveled was in the Great Hall but the speed was also greatest in this room. Forty-two percent of the visitors walked down both sides of the room, but the other visitors walked down only one side, merely looking across the room at the exhibits on the opposite side.

The shortest length of time was spent in the Hall of Invertebrates. The shortest space covered was in this hall too. This brief attention may be the influence of the power of the "exit gradient" and/or the homogeneity of the method of display. Of the visitors who came into this hall, 66 percent looked only at the cases between the point of entrance and the exit. By reference to Figure 3, it can be seen how close these two doors are to each other. The Entrance Hall with the stairway to the third floor may serve as an attraction greater than the exhibits in the remainder of the hall, particularly since all the cases, except one near the door, are uniform in size. This barrier was passed by only 34 percent of the visitors, who went straight to the end of the hall to see a lighted habitat case, and looked at only those exhibits displayed in an unconventional fashion on the return path. Perhaps the fact that this hall does not lead into any other hall is also an important factor in preventing the casual visitor from traversing its length.

Melton explained a lack of interest in certain portions of an art museum in terms of "object satiation" which was a function of the

TABLE I

Time, in Minutes and Seconds, Spent by Each of 50 Visitors in Each of the Five Halls on the First Floor of the Peabody Museum: No Leaflets Issued

Case Number	Date	Sex	Estimated Age	Accompanied by	To 3rd Floor?	Time, in Minutes and Seconds, in Museum Halls on 1st Floor					
						Man	Mammals	Mammals	Great Hall	Invertebrates	Total
1	Nov.	M	20	M	Yes	1:00	1:05	2:06	6:25	2:31	13:07
2	"	F	24	2M, F	Yes	10:50	7:30	9:00	10:05	5:35	43:00
3	"	M	40	2F	Yes	10:20	8:00	5:05	10:26	12:22	46:13
4	"	F	25+	M	Yes	15:42	7:43	2:38	5:04	3:04	34:11
5	"	M	50	M	No	5:50	5:37	5:50	4:57	0:42	22:56
6	"	F	25+	F	Yes	5:30	1:12	3:00	4:03	0:18	14:03
7	"	M	35	M, 2F	No	8:30	3:00	3:20	6:00	7:00	27:50
8	"	M	20	F	Yes	15:00	4:00	3:00	8:00	6:15	36:15
9	Dec.	M	55	F	No	12:45	6:10	10:05	11:25	9:30	49:55
10	"	F	30	M, F	Yes	3:45	3:00	1:35	5:25	3:35	17:20
11	"	M	25+	F	No	9:09	6:20	4:06	7:07	5:06	31:48
12	"	F	25	M	Yes	8:40	3:35	1:50	8:35	3:50	26:30
13	"	F	45	M	Yes	5:20	8:45	8:00	4:00	5:50	31:55
14	"	M	20	M	No	5:20	1:14	1:59	2:36	3:33	14:42
15	"	F	40	2M, F	Yes	10:00	5:00	7:15	14:15	3:00	39:30
16	"	F	20	F	Yes	7:51	3:32	0:31	3:25	0:10	15:29
17	"	F	45+	M, F	Yes	3:44	1:44	2:50	5:08	2:00	15:26
18	"	F	20	F	Yes	5:17			3:48	4:15	13:20
19	"	M	30	F	Yes	3:56	2:00	0:45	0:56	0:44	8:21
20	"	M	28	M, F	Yes	5:41	4:44	2:20	5:47	4:18	22:50
21	"	M	35	M	No	5:55	3:55	4:50	3:55	2:10	20:45
22	"	M	40	F	Yes	0:50	2:00	3:00	2:50	3:15	11:55
23	Jan.	M	40	M	Yes	1:20	7:05	4:45	7:30	4:45	25:25
24	"	M	20	M	Yes	2:15	6:05	1:55	2:55	1:50	15:00
25	"	F	25	M, F	Yes	10:00	6:45	4:20	10:15		31:20
26	"	F	50	F	Yes	3:35	0:55	2:15	1:25	11:30	19:40
27	"	M	30	2F, M	Yes	9:25	3:35	6:35	6:05	2:10	27:50
28	"	F	21	M	Yes	5:20	3:55	7:05	3:00	1:55	21:15
29	Feb.	M	40	3F	No	5:05	1:25	2:05	1:00		9:35
30	"	M	50	M	No	9:10	0:40	2:05	3:25	2:00	17:20
31	"	F	35	F	Yes	7:15	8:45	5:35	10:00	2:10	33:45
32	Mar.	M	30+	F	No	6:35	6:55	11:15	5:50	0:03	30:38
33	"	F	60	F	No	15:18	2:52	7:49	8:37	3:51	38:27
34	"	M	30	4F	Yes	12:15	5:00	10:05	4:20	3:20	35:00
35	"	M	20+	M	Yes	1:34	1:06	1:44	1:10	1:42	7:16
36	"	M	50	M	Yes	7:40	9:50	5:00	2:55	2:40	28:05
37	"	F	25	2M	No	1:00	2:05	1:55	5:00	3:40	13:40
38	"	F	25	2M, 3F	Yes	0:17	2:27	4:55	7:55	0:42	16:16
39	"	M	30	M, 2F	Yes	7:00	10:30	5:30	3:40	0:35	27:15

TABLE I—*Concluded*

Case Number	Date	Sex	Estimated Age	Accompanied by	To 3rd Floor?	Time, in Minutes and Seconds, in Museum Halls on 1st Floor					
						Man	Mammals	Mammals	Great Hall	Invertebrates	Total
40	Mar.	F	40	M, F	Yes	6:00	2:25	2:45	2:15	1:18	14:43
41	May	M	45	2F	No	3:00	2:30	3:30	4:10	1:45	14:55
42	"	M	22	2F, 2M	Yes	0:55	3:35	3:20	17:20	0:30	25:40
43	"	F	21	3F	Yes	9:00	5:40	4:50	9:30	4:50	33:50
44	"	F	20+	2M, F	Yes	5:12	7:30	6:39	12:15	3:18	34:54
45	"	F	25	F	No	5:36	1:28	2:39	5:31	3:05	18:19
46	"	F	50	F	Yes	8:11	1:49	0:59			10:59
47	"	F	20	M	Yes	0:31	0:35	1:00	0:49	0:16	3:11
48	"	M	20	F	Yes	6:10	3:30	1:35	3:05	4:45	19:05
49	"	M	25	M	Yes	3:00	4:00	2:20	6:35	6:05	22:00
50	"	M	28	2F, M	No	0:55	0:55	1:40	5:05	1:00	9:35
Mean (in minutes).....					(72%)	5.74	3.68	3.60	5.42	2.96	21.40
Standard Deviation.....						4.01	2.70	2.76	3.90	2.92	10.83

homogeneity of the method of display, and he stated that to relieve this manifestation of "fatigue" by heterogeneity of display was a good reason for including the period-room in an art museum.[7] Such an explanation may also be applied to this museum situation. In each of the halls preceding the Hall of Invertebrates there are peaks of interest wherever there is variation in the mode of display; and, though the total interest in museum cases is lower for this hall than for the preceding four halls, here too, there are peaks at the points of greatest variation in exhibition. For example, at the five lighted habitat cases in this hall the frequency of stops ranges from 21 to 32; whereas, at the cases of uniform size and arrangement the frequency of stops ranges from 0 to 10.

Learning experiments have shown that the more monotonous a stimulus becomes, the more the attention wanders, and that any change from the habitual tends to attract and hold attention.[8] Melton found that on the average the attraction-value of paintings tended to decrease as the visitor progressed around the gallery from

[7] Arthur W. Melton. *Problems of Installation in Museums of Art*, p. 261.

[8] C. Murchison (editor). *Handbook of Experimental Psychology*, Chapter 12. "The Work of the Integrated Organism," by E. S. Robinson, pp. 609–613.

right to left. In the Peabody Museum, though there is a gradual decrease in interest throughout the entire visit, if the last exhibit before an exit is an open-mount or a lighted habitat case, it receives almost the same attention as the first case on the right of the entrance to a hall. This observation agrees with the theory that the gradual decrease in interest exhibited by museum visitors is due, not to physical "fatigue" of the visitor, but to the homogeneity of the method of display. This can be illustrated by the summary given in Table II.

TABLE II

Percentages of Visitors Who Examined the First and Last Exhibit Cases on the Right of the Entrance and the Exit in Each of the Five Exhibition Halls

Hall	Exhibit	First case at the right	Exhibit	Last case at the right
		per cent		*per cent*
I	Gorilla (in case)	78	Skeletons of great apes and man (in case)	74
II	Kodiak Bear (in case)	36	Black Bear, open-mount	52
III	Evolution of horse (in case)	26	Echidna (in case)	22
IV	So. Carolina Swamp (lighted habitat case)	76	Louisiana Swamp (lighted habitat case)	64
V	Carboniferous group (lighted habitat case—at the left)	64	Geologic History (chart in flat case against wall)	8

LABEL READING

Obviously, though the visitor can gain something from looking at an exhibit, if he is to form many new associations he must in most instances attend to the labels as well, and this involves the problem of reading. It is now known that reading is a psychological performance which depends upon a great many different factors. In the first place it depends upon the way the eyes are used and is therefore to some extent a motor skill. Reading also depends upon the meanings attached to forms and the association of ideas. Slow readers, for instance, may be slow either because of lack of the motor skill or because of inability to associate ideas at the usual rate.[9] Experiments have shown that the rate of reading depends too upon

[9] A. E. Traxler. "Relation between Rate of Reading and Speed of Association." *J. Educ. Psychol.*, 1934, pp. 357–365.

the size of type, length of line, and amount of leading between the lines.

In the museum situation, the reader is free to set his own pace. Examination of the records show, however, that of all the labels on all the cases in all the halls on the first floor, only four were read by 50 percent of the visitors. Each of these four labels was on an exhibit case containing several small exhibits and the labels did not tell much more than the name of the animal.

SUMMARY

When the individual records were examined, it was found that the route taken by the average visitor was the reverse of that planned in the Guide Book, 24.4 percent of the exhibits were examined, 10.9 percent of the labels were read, and the average time taken by the visitors for reviewing the history of life on the earth during the past 500,000,000 years was 21.40 minutes.

IV. LEAFLET EXPERIMENT

It was found by Robinson in his first museum study[10] that the average time spent in an art museum, the average number of pictures looked at, and the average number of rooms entered, were all increased if the visitor used a guidance pamphlet. Further experiments by Melton and Howard, and Melton and Feldman, with a guidance pamphlet in museums of art and of science indicate the following general conclusions:

> "1. In a study of a special exhibition of forty paintings at the 69th Street Branch of the Pennsylvania Museum of Art in Philadelphia, it was found that the use of wall labels that attempted a description of the aesthetic qualities of each painting caused the visitors to look at the paintings for a time which was much longer than the time spent when the wall labels contained only the names of the paintings and the painters, and this beneficial effect of the descriptive labels was greatly increased when the labels were gathered together in a pamphlet. This experiment was repeated in every detail at the Newark Museum, and the conclusions verified.
>
> "2. At the Buffalo Museum of Science similar comparisons of the effectiveness of wall labels and pamphlets in terms of the total time spent in examining the exhibits led to the conclusion that the use of pamphlets always resulted in the greatest interest in the exhibits."[11]

However, neither the arrangement of the museum exhibits nor the material in these guide pamphlets attempted to give the visitor a consecutive story such as that planned in the Peabody Museum. An attempt was made, therefore, to observe the behavior of Sunday visitors in this museum when they were given a leaflet which emphasized the unity of the planned sequence of the exhibits, i.e., one

[10] Edward S. Robinson. *The Behavior of the Museum Visitor. Publications of the American Association of Museums, New Series, No. 5, 1928*, pp. 53-65.

[11] From MSS concerning pamphlet studies to be published soon in the *Publications of the American Association of Museums*, by A. W. Melton and R. F. Howard under the title "Studies of Labelling in Museums of Art," and A. W. Melton and N. G. Feldman under the title "Studies of Installation and Labelling in Museums of Natural History."

which stressed those exhibits that demonstrate most clearly the story of organic evolution. Other visitors were given one which merely pointed out certain interesting exhibits without stressing their importance in the story of evolution, i.e., a leaflet which mentioned exhibits because of their inherent interest without regard to their significance for the planned sequence. (See page 1 of each of these leaflets, Figures 4 and 5).

One set of the leaflets was placed on a small table at the right of the front door in the Entrance Hall with a sign that read: "GUIDE TO EXHIBITS OF ESPECIAL INTEREST."

Not many visitors took a leaflet. Several took one at the end of their visit rather than at the beginning. Therefore, in order not to limit the choice of visitors observed with the leaflets, one of the observers stood by the table in the Entrance Hall and handed a leaflet to every visitor as he came into the museum. For two seasons from October through May the behavior of the visitors who came to the museum on Sunday afternoons was observed with an alternation of the experimental conditions. That is, on one Sunday no leaflets were distributed and from these results came the control data reported in the previous section. On the next Sunday the leaflets that stated *The Different Kinds of Animal Life* were issued, and on the third Sunday the leaflets concerning *The Gradual Development of Animal Life* were placed in the hands of all the visitors. The fourth Sunday this sequence was begun again. In this way observations of one hundred and fifty adult visitors, accompanied by other adults, never by children, were assembled.

In these two seasons of observations not more than half a dozen visitors refused to take a leaflet when it was handed to them. The excuse offered by those who did not take one was that they had left their glasses at home. About 75 percent of the people returned them before going to the third floor if they were asked to do so when the leaflet was handed to them. If no such request was made not more than 25 percent of the people returned them. Many visitors expressed pleasure at receiving the leaflet and some were disappointed at not having any such guide for the exhibits on the third floor.

The manner in which the leaflet was presented to the visitor largely determined his use of it. A feeling of friendly cooperation could be deliberately induced by explaining what the leaflet was for and by making the visitor feel at home and getting him started on his

PEABODY MUSEUM OF NATURAL HISTORY

YALE UNIVERSITY

THE DIFFERENT KINDS OF ANIMAL LIFE *are illustrated by the exhibitions in each hall on this first floor. Entering the room on the right you can see models showing some of the different types of mankind. Here may also be found demonstrations of certain biological principles such as heredity and the suitability of some animals for their particular surroundings.*

THE HALL OF MAN

In the first case—*No. 10*—on your right is the gorilla. Even though the arms are much longer than the legs, the gorilla travels on all four limbs either walking or running.

The Polynesian warrior in the next case—*No. 9*—is shown in the act of defending himself by means of a stone thrown from a sling.

Case *No. 8*, ahead of you, contains a tortoise shell cat, rosette-haired guinea pigs and several albino animals.

Passing around case *No. 8*, in the corner, you will observe an exhibition—case *No. 7*—showing how such animals as the gila monster, rattlesnake, horned lizards and birds are adapted to live in the desert regions of Arizona.

In the opposite corner—case *No. 3*—are animals that live in the Arctic regions. All of them are almost entirely white in color. Even the young seals are white though their parents are wholly or partly dark in color at all seasons.

Variations in animal color are shown in greater detail in case *No. 2*.

Passing to the other side of case *No. 2* in the center section you will find models illustrating how the human body begins. There are also models showing development in the frog and the chicken.

Case *No. 1*, along the wall, is occupied by man's nearest relatives, not his immediate ancestors. These skeletons are arranged in sequence to show the striking similarities in their structure.

The center case—*No. 13*—nearest the skeletons, contains models of the heads of various races of prehistoric man.

The second of these center cases—*No. 12*—shows the cultural development of man as illustrated by the work of his hands.

FIG. 4. First page of a four-page leaflet for visitors

tour of the museum with a definite purpose. As the experiment continued this rapport seemed to be the most important single factor in the success of the leaflet.

When the leaflet was first received it was usually read at once,

PEABODY MUSEUM OF NATURAL HISTORY

YALE UNIVERSITY

THE GRADUAL DEVELOPMENT OF ANIMAL LIFE *is illustrated by the exhibitions on this first floor. Entering the room on the right you can begin this story with the last chapter. This deals with mankind, the group of animals with the greatest mental development. Passing through the other halls you will finally reach the first chapter dealing with the simplest animals known.*

THE HALL OF MAN

In the first case—*No. 10*—on your right is the gorilla, one of man's nearest relatives.

The Polynesian warrior in the next case —*No. 9*—is an illustration of a member of one of the sub-divisions of the mongoloid or so-called yellow race.

Case *No. 8* ahead of you, shows some of the changes that may occur naturally in each new generation. Every animal reproduces its own kind, but the new generation may show changes in detail from its parents, as is illustrated by the cats, squirrels, skunks, etc.

The opposite side of case *No. 8* shows how variations may in time become fixed by breeding as illustrated by the pigeons.

Exhibitions showing the response of animals to life in desert regions—case *No. 7*—and in the far north—case *No. 3*—are in the opposite corners of the hall.

Case *No. 2* deals with color in animals.

Passing to the other side of case *No. 2*, the first section on your right shows by a comparison of skulls how the apes and man trace back to a similar ancestor more than sixty million years ago.

In the next section of case *No. 2* are comparisons of the development of the human body with that of the frog and the chicken.

The right hand case—*No. 1*—along the wall is occupied by man's nearest relatives, not his immediate ancestors, but offshoots from a common ancestor, arranged in sequence to show the striking similarities in the structure of the skeleton.

The center case—*No. 13*—nearest the skeletons, contains models of the heads of various races of prehistoric man showing the known stages in his development. Note the changes in appearance brought about by the receding of eye-brow ridges and muzzle, the

FIG. 5. First page of a four-page leaflet for visitors

either all the way through or only for the first hall. Each observer indicated on his route sheet whenever the visitor read or referred to his leaflet in locating the exhibits. Reference to Tables III and IV will show that the fifty visitors observed with the leaflet con-

TABLE III

Time, in Minutes and Seconds, Spent by Each of 50 Visitors in Each of the Five Halls of the Peabody Museum: Leaflet Emphasizing "Different Kinds" Issued

Case Number	Date	Sex	Estimated Age	Accompanied by	To 3rd Floor	Leaflet Time, in Minutes and Seconds, in Museum Halls on 1st Floor						
						Times Used	Man	Mammals	Mammals	Great Hall	Invertebrates	Total
1	Oct.	M	40	2F, M	Yes	8	12:55	10:40	5:20	13:30	5:10	47:35
2	Nov.	M	20	F	Yes	16	63:50	27:00	7:20	17:40	5:55	121:45
3	"	M	50	M	Yes	7	7:26	9:47	3:05	9:43	4:50	34:51
4	"	F	30	M	Yes	4	9:32	4:40	7:40	14:20	5:55	42:07
5	"	M	35	F	No	3	4:30	4:55	4:10	20:50	2:05	36:30
6	"	M	27	F	Yes	6	23:15	7:20	5:10	9:10	6:15	51:10
7	"	M	44	F	Yes	0	13:15	3:55	1:15	3:00	3:10	24:35
8	"	F	40	4F	Yes	8	8:15	3:27	2:00	5:43	2:00	21:25
9	"	F	25	F	No	10	24:50	11:25	11:42	9:02	11:06	68:05
10	"	F	28	M, F	Yes	2	2:35	5:38	3:22	4:43	5:54	22:12
11	"	F	40	2F, 2M	Yes	6	13:30	3:56	9:43	10:45	21:48	59:42
12	"	F	30	2F, M	Yes	2	11:32	5:30	3:33	4:43	4:23	29:41
13	"	F	25	3M, 2F	Yes	3	2:20	2:55	2:50	4:45	1:40	14:30
14	"	F	22	M	Yes	4	3:35	2:10	5:20	4:50	1:45	18:00
15	Dec.	M	23	M	Yes	13	28:10	6:15	7:40	10:30	4:45	57:20
16	"	M	20	M	Yes	3	6:40	4:30	3:12	3:35	0:35	18:32
17	"	M	30	F	Yes	5	29:12	14:05	6:20	11:45	2:35	63:57
18	"	M	50	M	Yes	2	3:30	5:10	11:15	11:10	2:05	33:10
19	"	F	26	F, 2M	Yes	3	16:00	10:05	6:55	7:45	1:45	42:30
20	"	F	28	2F, M	Yes	0	4:50	2:50	1:55	3:12	4:06	16:53
21	"	F	25	F	No	2	2:40			2:40		5:20
22	"	F	38	M, 2F	Yes	8	11:10	6:45	6:30	8:05	2:45	35:15
23	Jan.	F	28	F	Yes	7	12:10	6:39	4:50	5:30	10:53	40:02
24	"	M	20	2M	Yes	1	6:00	2:20	2:10	1:50	0:30	12:50
25	"	F	21	M	No	2	11:45	4:40	5:00	8:30	4:15	34:10
26	"	M	48	M	No	2	4:15	2:10	3:00	4:05	0:35	14:05
27	Feb.	M	30	M	No	2				3:00	6:20	9:20
28	"	M	55	F	Yes	1	5:32	8:08	13:34	10:10	3:15	40:39
29	"	F	28	F	Yes	2	11:55	6:00	4:30	12:00	1:05	35:30
30	"	F	25	M	No	4	31:25	23:00	13:55	11:55	5:55	85:10
31	"	F	45	F, M	No	2	15:10	11:30	10:55	15:45	22:20	75:40
32	"	F	50	M	Yes	8	38:30	13:40	18:00	10:45	27:20	108:15
33	"	F	35+	M	Yes	2	25:26	8:06	13:34	17:19	11:27	75:52
34	"	F	40	3M, F	Yes	2	13:55	9:00	8:25	20:30	4:00	55:50
35	Mar.	F	50	M	No	2	12:15	2:25	1:20	2:00	4:40	22:40
36	"	F	28	2M, F	Yes	6	8:45	3:50	5:45	6:30	11:15	36:05
37	"	F	45	M, 2F	Yes	9	10:55	7:25	3:55	10:00	2:35	34:50
38	"	M	40	M	Yes	7	8:30	5:15	2:35	15:40	10:00	42:00
39	"	M	30	F	No	1	1:40	2:10	1:30	3:10	1:15	9:45

TABLE III—*Concluded*

Case Number	Date	Sex	Estimated Age	Accompanied by	To 3rd Floor	Leaflet Time, in Minutes and Seconds, in Museum Halls on 1st Floor						
						Times Used	Man	Mammals	Mammals	Great Hall	Invertebrates	Total
40	Mar.	M	30	F	Yes	2	24:00	5:05	5:40	12:15	0:20	47:20
41	"	M	24	F	No	2	6:25	4:50	3:50	6:30	3:40	25:15
42	"	M	45	M	Yes	4	2:10	4:35	2:45	7:25		16:55
43	Apr.	M	35	2F, M	Yes	1	6:30	3:10	2:15	5:10	1:20	18:25
44	"	M	22	2M	Yes	6	7:15	3:20	1:40	3:20	2:45	18:20
45	"	M	50	F, 3M	No	2	17:20	9:00	6:25	9:50	7:45	50:20
46	"	M	30	F	No	7	7:00	6:50	5:30	1:50	4:50	26:00
47	"	M	24	F	Yes	11	10:25	5:00	5:30	9:00	2:35	32:30
48	"	F	60	M	Yes	2	18:25	7:45	14:45	30:00	4:05	75:00
49	May	F	45	M, 2F	Yes	0	10:35	3:45	3:40	11:20	6:00	33:20
50	"	M	25	2M	Yes	0	1:40	3:40	1:40	8:25	4:55	20:20
Mean (in minutes).....					(74%)	(4.24)	12.92	6.33	4.87	8.62	5.16	37.90
S.D.....							11.16	4.84	4.02	5.74	5.48	24.69

cerning *The Different Kinds of Animal Life* used it on an average of 4.24 times and the fifty observed with the leaflet which had to do with *The Gradual Development of Animal Life* used it 3.44 times on an average. The maximum number of times that the first leaflet was used by any individual was 16; and the second leaflet, 19. The number of occasions when the visitors used either leaflet was greatest while in the Hall of Man, the first room to be visited. As a result 56 percent of the visitors with a leaflet stayed longer in this hall than in any of the following rooms, as compared with the 44 percent who stayed in this hall longer without a leaflet.

An average of the total time spent in each hall as reported in Tables I, III, and IV shows a mean total time of 37.90 minutes for the leaflet concerning *The Different Kinds of Animal Life* and a mean total time of 32.48 minutes for those using the leaflet having to do with *The Gradual Development of Animal Life*, as compared with the mean total time of 21.40 minutes for the visitors with no leaflets. Table V summarizes the times spent in each museum hall under these three experimental conditions.

Criticism of the soundness of conclusions drawn from these data may be raised because of the limited number of observations recorded.

TABLE IV

Time, in Minutes and Seconds, Spent by Each of 50 Visitors in Each of the Five Halls of the Peabody Museum: Leaflet Emphasizing "Gradual Development" Issued

Case Number	Date	Sex	Estimated Age	Accompanied by	To 3rd Floor?	Leaflet Time, in Minutes and Seconds, in Museum Halls on 1st Floor						
						Times Used	Man	Mammals	Mammals	Great Hall	Invertebrates	Total
1	Nov.	F	35	M	Yes	3	3:30	0:45	0:33	2:30	3:07	10:25
2	"	M	35	2M	Yes	1	14:40	10:40	6:10	12:03	7:09	50:42
3	"	F	45	F	No	2	0:09	0:47	1:20	3:25	0:55	6:36
4	"	M	28	F	Yes	0	0:35	0:35	0:37	2:35	3:50	14:12
5	"	M	43	M	Yes	4	5:50	1:30	4:10	7:05	1:25	20:00
6	"	F	22	M	Yes	3	3:10	4:45	2:40	6:05	5:50	22:30
7	"	M	35	F, M	Yes	0	1:15	4:15	5:45	3:55	3:15	18:25
8	"	F	48	M	Yes	3	13:10	3:40	2:35	5:15	0:30	25:10
9	"	M	23	M	Yes	4	14:30	5:40	4:35	6:30	1:03	32:18
10	"	F	55	2M	Yes	2	12:25	5:10	3:35	12:05	4:55	38:10
11	"	F	27	M	Yes	3	9:35	3:55	3:45	9:50	5:00	32:05
12	"	F	23	M	Yes	2	4:10	5:50	3:05	1:50	3:40	18:35
13	"	M	50	2F, M	Yes	2	1:45	1:40	1:30	4:30	0:01	9:26
14	"	M	22	2F, M	Yes	1	18:20	8:30	7:50	15:20	10:20	60:20
15	Dec.	F	34	M, F	Yes	1	8:20	6:00	12:00	9:45	2:20	38:25
16	"	F	45	F, 2M	Yes	1	5:30	9:45	4:10	5:15	2:30	27:10
17	"	F	20	3F	No	4	7:20	1:04	0:25	4:30	4:05	17:24
18	"	F	50	F	No	2	14:30	3:20	3:20	3:10	3:50	28:10
19	"	F	28	2M, F	Yes	1	4:35	0:45	3:15	3:25	7:05	19:05
20	"	M	35	M	Yes	7	15:40	7:10	3:35	7:15	2:20	36:00
21	"	M	20	M	Yes	3	8:40	2:30	1:20	6:15	3:00	21:45
22	"	M	26	2F	Yes	3	7:45	5:50	4:40	4:40	1:35	24:30
23	Jan.	M	30+	F	Yes	19	12:35	6:41	8:28	8:48	14:04	50:36
24	"	M	35	M	Yes	5	13:40	4:55	12:05	14:45	13:30	58:55
25	"	F	28	M	Yes	1	10:10	5:15	3:30	9:45	3:05	31:45
26	Feb.	F	60+	2F	No	3	19:50	5:15	6:00	4:30	24:10	59:45
27	"	F	30	F	Yes	7	22:05	12:50	5:40	9:10	7:10	56:55
28	"	F	45+	2M	No	8	18:06	13:19	29:15			60:40
29	"	F	20	4F	Yes	1	25:15	14:45	10:10	8:30	0:50	59:30
30	"	M	50	F, M	Yes	3	14:00	4:40	2:45	3:00	4:00	28:25
31	"	M	23	M, 2F	Yes	7	26:10	5:15	7:25	10:00	8:15	57:05
32	"	M	50	M	Yes	4	8:24	3:58	3:16	5:04	5:56	26:38
33	"	M	30	F	Yes	16	51:00	19:00	8:20	19:15	2:45	100:20
34	Mar.	M	55	3M	Yes	1	13:10	7:35	9:00	5:30	3:45	39:00
35	"	M	30	M, 2F	Yes	4	5:40	2:00	1:50	3:40	0:45	13:55
36	"	M	25	M, 3F	Yes	3	13:00	1:45	3:00	5:00	0:25	23:10
37	"	F	20	M	No	5	13:45	7:00	7:00	5:30	1:10	34:25
38	"	F	20	2F	Yes	2	8:10	8:55	9:10	4:35	1:25	32:15
39	"	F	30	M	Yes	3	11:35	8:40	4:25	5:00	1:15	30:55

TABLE IV—*Concluded*

Case Number	Date	Sex	Estimated Age	Accompanied by	To 3rd Floor?	Leaflet Time, in Minutes and Seconds, in Museum Halls on 1st Floor						
						Times Used	Man	Mammals	Mammals	Great Hall	Invertebrates	Total
40	Apr.	F	40	2M	Yes	1	6:00	3:00		11:10	5:20	25:30
41	"	F	45	M	No	2	10:05	0:55	1:05	3:50	0:20	16:15
42	"	F	25	M, F	Yes	3	12:40	4:45	5:20	8:10	5:45	36:40
43	"	M	25	M	No	9	10:35	8:00	9:55	11:35	15:30	55:35
44	"	M	45	2M	Yes	1	7:00	5:00	2:15	7:10	3:20	24:45
45	May	M	45	3F, M	Yes	3	8:35	2:40	2:35	7:40	5:05	26:35
46	"	M	30	M	Yes	0	3:25	4:25	1:55	3:15	2:40	15:40
47	"	F	45	F	Yes	2	11:05	4:20	6:20	9:10	19:45	50:40
48	"	F	23	M	Yes	2	15:20	3:30	3:00	11:20	4:20	37:30
49	"	F	2[illegible]	M	Yes	3	15:05	7:45	7:10	11:10	6:00	47:10
50	"	F	45	F	Yes	2	8:25	4:00	3:05	7:30	4:05	27:05
Mean (in minutes)					(84%)	(3.44)	11.52	4.98	4.74	6.62	4.62	32.48
S.D.							7.95	3.82	4.62	3.78	4.94	17.64

The total length of time spent by the average visitor on the first floor of the museum made it impossible for each observer to obtain more than four records on any Sunday afternoon when the leaflets were given out. The museum is not large and more than two observers might have become conspicuous if all of them had been working in the same hall at one time. However, a larger number of observations was not necessary to show the effect of a leaflet, for the time spent in the museum under each of the experimental conditions is significantly greater than that for the control group as is shown by Table VI.

The ratio between a difference obtained under any two experimental conditions and the standard deviation of the difference is a measure of the reliability of the obtained difference. Whenever this ratio is 3.00 or more the obtained difference may be considered reliable. The ratio for the difference between the times for the two leaflets (*i.e.*, 1.2) is not a significant one; therefore, an average of the two leaflet conditions was used in making a comparison between the experimental (*i.e.*, leaflet) and the control conditions (*i.e.*, no leaflet).

Table VII shows an increase of 8.2 percent in the frequency with which museum exhibits were examined and an increase of 7.6 percent

TABLE V

Mean Total Time, in Minutes, Spent in Each Hall on the First Floor

Museum Hall	No Leaflet	Leaflet: "Gradual Development"	Leaflet: "Different Kinds"
I. Man	5.74	11.52	12.92
II. Mammals	3.68	4.98	6.33
III. Mammals	3.60	4.74	4.87
IV. Great Hall	5.42	6.62	8.62
V. Invertebrates	2.96	4.62	5.16
Entire 1st Floor	21.40	32.48	37.90
Standard Deviation	10.83	17.64	24.69
Number of visitors	50	50	50

TABLE VI

Standard Ratios for the Mean Differences between Total Times in Each Hall Obtained under Experimental Conditions

Museum Hall	Control *vs.* Different Kinds	Control *vs.* Gradual Development	Different Kinds *vs.* Gradual Development
I. Man	4.2	4.7	0.7
II. Mammals	3.3	3.3	0.1
III. Mammals	1.8	1.6	0.1
IV. Great Hall	3.2	1.6	0.2
V. Invertebrates	2.4	2.0	0.5
Entire 1st Floor	4.4	4.0	1.2

TABLE VII

A Comparison of the Percentage of Visitors Who Examined Each Museum Exhibit and the Percentage of the Labels Read between the Leaflet and No Leaflet Conditions

Museum Hall	Number of Exhibit Cases in Each Hall	Percentage of Times Each Case Was Examined		Percentage of Times Each Label Was Read	
		No Leaflet	Leaflet	No Leaflet	Leaflet
I. Man	22	46	62	22	36
II. Mammals	31	30	38	12	24
III. Mammals	30	30	40	12	20
IV. Great Hall	48	22	28	10	16
V. Invertebrates	56	12	18	10	10
Entire 1st Floor	187	24.4	32.6	10.9	18.5

TABLE VIII

A Comparison of the Frequency with Which Exhibits Mentioned in a Leaflet Were Examined and the Frequency with Which Exhibits Not Mentioned in a Leaflet Were Examined, with and without the Use of One of the Leaflets

Museum Hall	Number of Visitors Who Examined Museum Cases Mentioned		Number of Visitors Who Examined Museum Cases Not Mentioned	
	No Leaflet	Leaflet	No Leaflet	Leaflet
I. Man	28	35	16	24
II. Mammals	19	25	13	15
III. Mammals	20	27	10	14
IV. Great Hall	16	19	9	11
V. Invertebrates	11	14	3	7
Average	18.8	24.0	10.2	14.2

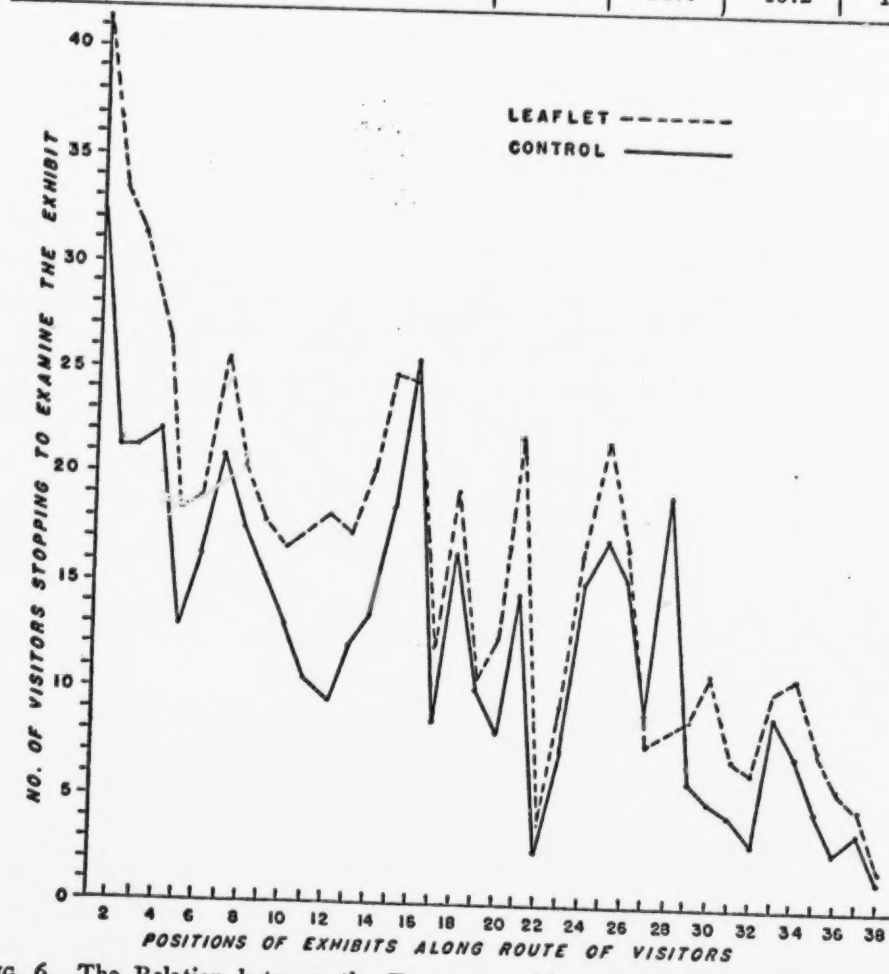

FIG. 6. The Relation between the Frequency with Which Visitors Stopped before Exhibits (When Grouped in Units of Five) and the Position of the Exhibit along the Route of the Visitor

in the frequency with which the labels were read when a leaflet was used.

The increase in the length of time spent on the first floor of the museum was not limited to those exhibits mentioned in the leaflet. Table VIII shows that the influence of the leaflet was spread to museum cases to which the visitors' attention was not called. The average increase in the frequency with which museum cases were examined in all of the five halls was 5.2 for those mentioned in either

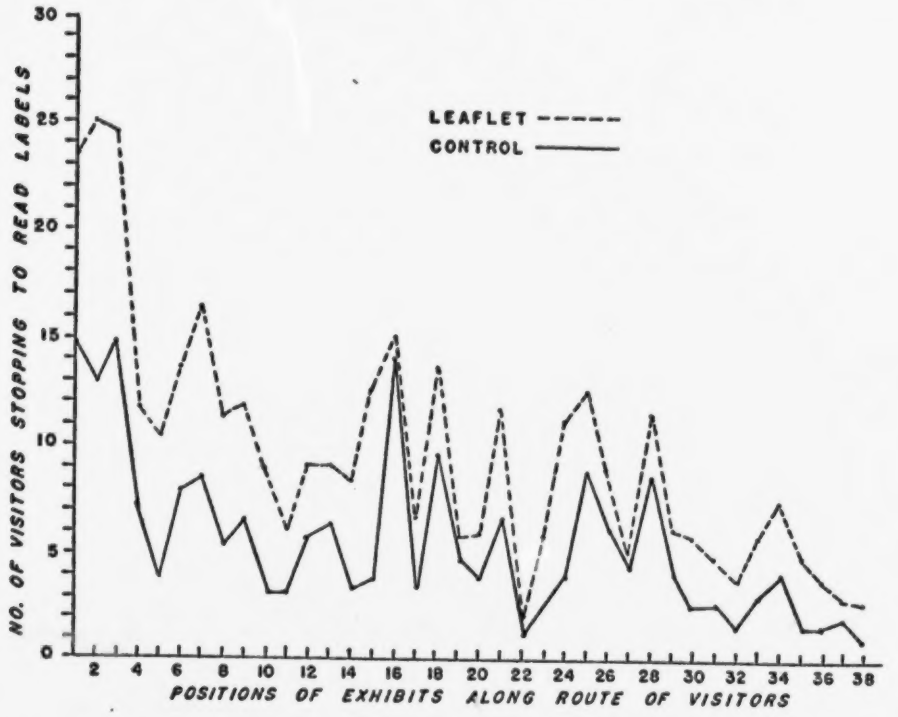

FIG. 7. The Relation between the Frequency with Which Visitors Stopped to Read Labels (When Grouped in Units of Five) and the Position of the Exhibit along the Route of the Visitor

leaflet and 4, nearly as great an increase, for those museum cases not mentioned by either leaflet. The use of the leaflets apparently improved the visitors' attitude toward all the museum exhibits.

Finally, we may examine the data with reference to the problem of "museum-fatigue" and the extent to which such fatigue is alleviated by the leaflets. Figure 6 is a diagram which shows the frequency with which visitors stopped to examine exhibits in the first five, second five, third five cases, etc., passed during the visit. In Figure 7

comparable data on the frequency of label reading are given. Both of these curves show a gradual decrease in interest with occasional high points which include unusual methods of display, as the visitor progresses through the halls. The slope of the curve for the leaflet conditions, while generally higher than that of the control condition, also shows a decrease in museum-interest. Museum-interest had not disappeared entirely when the circuit of the first floor was completed, for with no leaflet 72 percent, and with a leaflet 79 percent of the visitors went to the third floor.

V. CONCLUSIONS

Guidance leaflets will be used by the casual Sunday-visitor, and their use will result in an increase in the total length of time spent with the exhibits, an increase in the number of exhibits examined (including exhibits not mentioned in the leaflet), and an increase in the number of labels read.

Mere juxtaposition of exhibits in a logical sequence does not, by itself, guarantee their examination by the casual Sunday-afternoon visitor in the order intended. But the route of the visitor can be guided.

The guidance leaflets minimized but did not eliminate "museum-fatigue" or object satiation. On the other hand, when no leaflet was used only 46 percent of the visitors stayed longer in the first room entered than in any succeeding hall but when the visitors used a leaflet 71 percent of them stayed in this first hall a longer time than any other room. Further observations must be made when the material in the leaflets has been divided into smaller units and presented to the visitors at the entrance to each of the other halls.

The importance of the personal factor involved in handing the leaflet to the visitor must not be overlooked. The manner in which he is given museum-guidance is probably just as important as the assistance offered to him.

It may be that having examined the proper exhibits and having read a reasonable number of labels, the casual visitor still does not comprehend their significance; but it is fair to assume that those who have behaved in this way have benefited more than those who have spent only half as much time in the museum, examined very few exhibits, and read practically no labels. The difference in the behavior of the visitors when they had leaflets and when they had none was so great that it was statistically significant in spite of the high variability of such measures and the relatively small number of visitors observed.